

BIOLOGICAL EVALUATION OF SOUTHERN PINE BEETLE
ON THE NATIONAL FORESTS IN MISSISSIPPI

by

Wesley A. Nettleton and Michael D. Connor^{1/}**ABSTRACT**

Aerial surveys and ground checks for southern pine beetle (SPB) were conducted on 226,110 acres of National Forest land in Mississippi (parts of the Tombigbee, Bienville, and Holly Springs NF) during August and September 1981. SPB activity is at such a low level that Forest Pest Management recommends that the SPB suppression projects be discontinued.

INTRODUCTION

The State of Mississippi experienced epidemic SPB population levels during 1979 and 1980 (Collins 1980, Connor and Nettleton 1980). Losses to SPB were expected to remain high during the summer of 1981.

Biological evaluations were conducted on the Tombigbee (Aug. 25, 1981), Bienville (Aug. 26, 1981), and Holly Springs (Sept. 2, 1981) National Forests in Mississippi to determine the status of SPB populations and the need to continue or discontinue their suppression projects for FY 82. These evaluations were conducted by personnel from State and Private Forestry, Forest Pest Management (FFPM), Alexandria, LA, Field Office.

METHOD OF EVALUATION AND ANALYSIS OF SPB INFESTATION**Aerial Survey and Ground Check**

Standard aerial sketch map procedures^{2/} were used for this evaluation, except that survey coverage was 100 percent.^{2/} The presuppression surveys

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^{2/} USDA Forest Service. 1970. Detection of forest pests in the Southeast. USDA For. Serv., Southeast. Area, State and Priv. For., Publ. S&PF-7, 51 p. USDA For. Serv., State & Priv. For., Atlanta, Ga.

were made by district personnel and spots of red and/or fading trees were recorded and plotted on Forest Service Class A maps.

FPM entomologists ground checked only those SPB spots considered to be active by the district personnel. Numbers of vacated and infested trees, basal area, age, and height were recorded.

RESULTS AND DISCUSSION

Tombigbee National Forest

Five SPB spots were detected during an aerial survey made in late July. These spots were ground checked and found to be inactive. Spots ground checked ranged in size from 5 to 10 trees. Several other spots were located but contained only Ips bark beetle infested trees.

SPB activity has decreased significantly on the Tombigbee NF. Therefore, it is recommended that the SPB suppression project be discontinued. The district personnel should try to minimize losses during periods of low level SPB populations through continued suppression of spots.

Bienville Ranger District

Only 2 SPB multiple tree spots were detected during the summer months. FPM personnel ground checked a 20 tree spot; it was found to be vacated. Several two- or three-tree spots have been detected, but were generally caused by lightning strikes and usually were infested by Ips bark beetles.

Due to the lack of significant SPB activity, it is recommended that the SPB suppression project be discontinued. The district should try to minimize losses during periods of low level SPB populations through continued suppression of spots.

Holly Springs National Forest

Eleven SPB infestations were detected during an aerial survey in late August. Five of these were thought to be active and were ground checked by FPM personnel. The data are summarized in table 1. The spots ranged in size from 6 to 26 trees. Only 12 infested trees were found in all of these spots.

Since only 4 spots were active and contained very few green infested trees, it is unlikely that large SPB losses will occur. Therefore, it is recommended that the SPB suppression project for the Holly Springs NF be discontinued. The district personnel should try to minimize losses during periods of low level SPB populations through continued suppression of spots.

RECOMMENDATIONS

1. SPB suppression projects should be discontinued on all of the National Forests in Mississippi.

Table 1. Summary of SPB ground check data for the Holly Springs NF, September 1981.

2. Districts should attempt to make their stands less attractive to SPB attack by identifying areas with high potential for resource loss and taking measures to prevent or reduce such losses. Appendix A outlines current FPM control and prevention techniques.
3. Detection flights will be scheduled by FPM on all districts during FY 82. Communications between the districts, the Supervisor's Office and FPM should continue in order to evaluate any changes in SPB populations.

REFERENCES

Belanger, R. P., and B. F. Malac. 1980. Silviculture can reduce losses from the southern pine beetle. U.S. Dep. Agric. For. Serv., Agric. Handb. 576, 17 p.

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APPENDIX A

ALTERNATIVES FOR SOUTHERN PINE BEETLE CONTROL

Five alternatives are recommended for southern pine beetle control. The following discussion briefly outlines these alternatives. For a more detailed description on conducting control procedures refer to the southern pine beetle handbook series (Agric. Handb. Nos. 558, 560, 575, 576).

Alternative 1. Remove trees through salvage.

Salvage is the method most often used for stopping the growth of existing spots. This strategy involves removing a buffer strip of noninfested trees, all green infested and red infested trees, and if desired, the trees already killed by the beetles. The buffer strip should surround the recently attacked trees. It should be 40 to 70 feet wide for most active spots, while a 100-ft strip (and occasionally larger) may be needed for large, rapidly expanding spots. As a rule, the width of the buffer should not exceed the average height of the trees in the spot. The SPB spot should be carefully surveyed and all trees to be removed should be marked.

To implement this alternative the buffer strip should be cut first. All infested trees should be cut next. Vacated trees are cut last and are removed only for utilization purposes. All trees should be felled toward the center of the spot. The reason for this is to keep infested trees as far away from noninfested trees as possible. This reduces the chance of beetles killing additional trees.

Alternative 2. Piling and burning.

Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly charring the bark of infested trees. The entire bark surface must be thoroughly charred to insure effective control. The order of priority for cutting, piling, and burning infested trees, particularly in large spots, is the same for Alternative 1. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts", every effort should be made to locate and treat all green infested trees during the piling and burning operation.

Alternative 3. Cut-and-leave infested trees.

This is accomplished by felling a buffer strip and all infested trees toward the center of the spot. The purpose is to stop spot growth. Use of this method causes beetles to disperse at a time of year when this behavior is unnatural. This results in a reduction of mass attacked trees and spot growth ceases. Cut-and-leave should only be used in the summer (May 1 - September 30), since these are the only months beetles are not dispersing. It should only be used on small spots, normally 50 infested trees or less.

Alternative 4. Chemically treat infested trees.

In this method, infested trees are felled toward the center of the spot, cut into workable lengths, and sprayed with lindane or Dursban® 4E. The purpose

of this method is to kill the beetle population. To be effective, all bark surfaces must be sprayed. This involves turning the logs which becomes more difficult as tree size increases.

Forest Pest Management, Alexandria Field Office, should be contacted prior to the extensive use of chemical control for an update on latest restrictions or application procedures.

Alternative 5. No Action.

SPB populations increase periodically. When they increase, large numbers of susceptible pines are killed. This may occur over one to several years, and then the SPB populations collapse and the corresponding pine mortality subsides. This will continue periodically until transition to a climax forest occurs.

Some cutting will have to be done even if this alternative is selected. Dead trees will begin to decay and eventually fall down. Any dead trees along roadsides or in high-use areas should be felled.

PREVENTIVE MEASURES

The preceding discussion, except the No Action alternative, presents only short-term, immediate control strategies. Preventive measures must be taken to help ward off the occurrence of southern pine beetle infestations in noninfested stands. Current preventive measures include:

1. Preventing or minimizing annosus root rot. Annosus root rot weakens trees, predisposing them to beetle attack.
2. Harvesting mature and overmature stands. Such stands are vulnerable to beetle attack and should be harvested as soon as possible after rotation age is reached.
3. Thinning stagnated stands. Overstocked stands are generally low in vigor and are more likely to be attacked. Basal areas in excess of 120 sq. ft/acre should be avoided and these stands should be thinned as heavily as R-8 guidelines allow.
4. Minimizing impact of natural disturbances which cause stand stress. These factors include ice, wind, hail, animal damage, flooding, erosion, poor soil fertility, etc. Corrective measures include: removing individually damaged trees or, in extreme cases, the entire stand; improving drainage; fertilizing; or performing any other treatments which improve stand vigor.
5. Minimizing or eliminating man-caused disturbances. Logging and pipeline or powerline construction require the use of heavy equipment which may cause tree skinning and soil compaction that significantly weakens trees. Efforts to minimize the damage caused by these activities can significantly reduce the possibility of having southern pine beetle problems.

6. Matching species to site. Off-site plantations seldom achieve the vigorous growth necessary to deter attacking beetles. Hardwood sites converted to pine also have the additional stress of hardwood competition.

PRECAUTIONARY STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in their original containers under lock and key out of reach of children and animals, and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear appropriate protective clothing.

If your hands become contaminated with a pesticide, wash them immediately with soap and water. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove the clothing immediately and wash skin thoroughly. After handling or spraying pesticides, do not eat or drink until you have washed with soap and water.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicide from equipment, do not use the same equipment for insecticides or fungicides that you used for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary landfill dump, or crush and bury them in a level, isolated place.

NOTE: Some states have restrictions on the use of certain pesticides. Check your state and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Environmental Protection Agency, consult your county agent, state extension specialist or FPM to be sure it is still registered for the intended use. For further information or assistance, contact Forest Pest Management, Alexandria Field Office, Pineville, La., 71360, (Telephone: FTS 497-7280, or Commercial 318/473-7280).